

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
6 October 2005 (06.10.2005)

PCT

(10) International Publication Number
WO 2005/093904 A1

(51) International Patent Classification⁷: **H01Q 15/00**

(21) International Application Number:
PCT/US2005/001295

(22) International Filing Date: 14 January 2005 (14.01.2005)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/536,444 14 January 2004 (14.01.2004) US

(71) Applicant (for all designated States except US): **THE PENN STATE RESEARCH FOUNDATION** [US/US];
304 Old Main, University Park, PA 16802 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **WERNER, Douglas, H.** [US/US]; 2365 Oak Leaf Drive, State College, PA 16803 (US). **MAYER, Theresa, S.** [US/US]; 117 Colgate Court, Port Matilda, PA 16801 (US). **BOSSARD, Jeremy, A.** [US/US]; 5K Graduate Circle, State College, PA 16801

(US). **DRUPP, Robert, P.** [US/US]; 11654 Little Patuxent Parkway, Apt. 204, Columbia, MD 21044 (US). **LIANG, Xiaotao** [CN/US]; 3407 Plaza Drive, State College, PA 16801 (US). **LI, Ling** [CN/US]; 772 W. Whitehall Road, State College, PA 16801 (US).

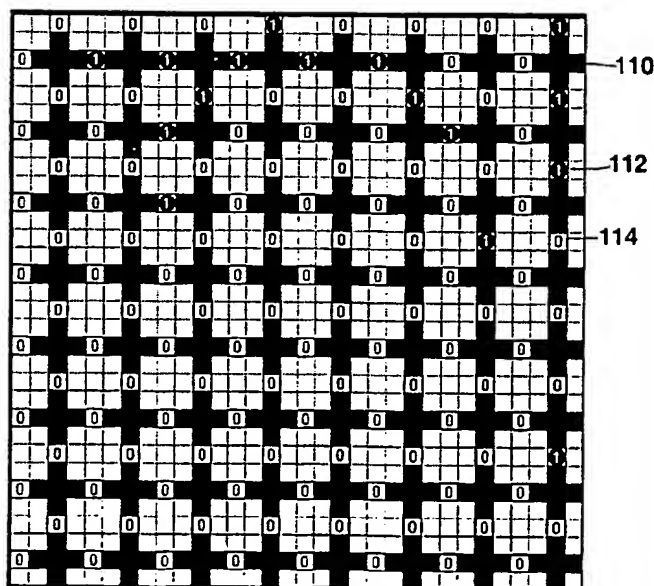
(74) Agents: **BANCROFT, Martin, S.** et al.; Gifford, Krass, Groh, Sprinkle, Anderson & Citkows, ki, PC, P.O. Box 7021, Troy, MI 48007-7021 (US).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH,

[Continued on next page]

(54) Title: **RECONFIGURABLE FREQUENCY SELECTIVE SURFACES FOR REMOTE SENSING OF CHEMICAL AND BIOLOGICAL AGENTS**



(57) Abstract: An improved frequency selective surface (FSS) comprises a periodically replicated unit cell, the unit cell including a material having a first electrical conductivity in the presence of an external condition, and a second electrical conductivity in the absence of an external condition, or in the presence of a modified external condition. For example, the material may be a chemoresistive material, having an electrical conductivity that changes in the presence of a chemical or biological analyte, i.e. having a first value of electrical conductivity in the presence of the analyte, and a second value of electrical conductivity in the absence of the analyte.

WO 2005/093904 A1



GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— with international search report

— before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.